

BENTLEY ELEMENTS COLLECTION LVT

INSTALLATION GUIDELINES: SQUARE, PLANK, CLICK AND FREE LAY

BENTLEY MILLS CORPORATE OFFICE: 14641 E DON JULIAN RD, CITY OF INDUSTRY CA 91746
800.423.4709 | BENTLEYMILLS.COM

This document refers to the following products:

Product	Size	Thickness	Installation direction	Seams treatment
Elements Square	See specifications	2.5mm	90°	None
Elements Plank	See specifications	2.5mm	Stair Step	None
Elements Click	See specifications	6mm	Stair Step	None
Adhesive: Elements Vol. One and Vol. Two				
Adhesive: Elements Vol. Three				
Elements Free Lay	See Specifications	5mm Free Lay	Stair Step	

Note: This document refers to the following standards. Please use current version available at time of installation:

- ACI 302.1R Guide for Concrete Floor and Slab Construction.
- ACI 302.2R Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
- ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F1869 Standard Test Method for Measuring Moisture Evaporation Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.
- ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compound
- ASTM F2873 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring
- ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings
- Recommended Work Practices for Removal of Resilient Floor Coverings of Resilient Floor Covering Institute (RFCI).

1. STORAGE AND HANDLING

Store boxes on clean, flat, and solid surfaces in a controlled environment. Do not store outside. Handle all materials carefully and safely.

1.1. ACCLIMATION

Under normal condition, the planks must be taken out of their boxes 16-24 hours prior to the installation. In cases where the flooring may have spent a long period of time in colder conditions, more time will be required for acclimate.

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2. SUBFLOOR PREPARATION

- The General Contractor will supply a smooth, flat concrete finish ready to receive the new resilient sheet flooring in accordance with ACI 302.1R Guide for Concrete Floor and Slab Construction and ACI 302.2R Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
- The concrete subfloor will be cured for a minimum of at least thirty (30) days.
- The slab will have a tolerance of 3/16" in a 10' radius.
- Prepare substrate as per ASTM F710 "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring".
- The concrete floor temperature will have to be maintained at a minimum of 65°F for 48 hours prior, during, and 48 hours after the installation.
- **The concrete slab, new or old, must be tested for moisture. We recommend having the tests performed by a recognized engineering firm. The ICRI website (International Concrete Repair Institute) has a list of certified technicians for the USA: <http://www.icri.org/Certification/Find-CCSMTTs.asp>.**
- The moisture tests must be performed as per ASTM F1869 "Standard Test Method for Measuring Moisture Evaporation Rate of Concrete Subfloor Using Anhydrous Calcium Chloride" and/or ASTM F2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes".
- **Substrate moisture levels shall not exceed:**

	Concrete slab with an effective moisture vapor barrier	Concrete slab with radiant heating system
Gerfix LVT & Plank Spray Adhesive	8-lbs / 95% RH	8-lbs / 95% RH
Gerfix TPS+ Adhesive	10-lbs / 95% RH	8-lbs / 90% RH
Bentley Healthbond 2399	10-lbs / 95% RH	8-lbs / 95% RH

FOR CLICK TILE ONLY:

- **Substrate shall not exceed 10lbs/1000 sq. ft./24 hrs. per ASTM F1869 and not to exceed 95% RH per ASTM F2170.**
- **Substrate with Radiant Heating Systems shall not exceed 8 lbs./1000 sq. ft./24 hrs. per ASTM F1869 and 90% RH per ASTM F2170. See instructions at 2.1.**
- **When full spread adhesion is needed, substrate moisture levels shall not exceed:**

	Concrete slab with an effective moisture vapor barrier	Concrete slab with radiant heating system
Gerfix LVT & Plank Spray Adhesive	8-lbs / 95% RH	8-lbs / 95% RH
Gerfix TPS+ Adhesive	8-lbs / 95% RH	8-lbs / 90% RH
Bentley Healthbond 2399	8-lbs / 95% RH	8-lbs / 95% RH

- Before proceeding with any work, inspect the subfloor surface and report in writing to the Project Manager and the General Contractor any visible defects on the surface such as cracks, bumps, rough areas or variations in evenness.
- Check the subfloor for grease, oil, paint, marker, spills, dust or any contamination that may adversely affect the adhesion of the flooring. Clean the subfloor according to the existing conditions.
- Prohibit circulation of other trades in the installation area.

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- Sanding of the subfloor will be mandatory in many cases; especially in areas where the subfloor has been contaminated with foreign products. It may be necessary to scarify or bead-blast concrete surface to remove existing adhesives, paint, concrete sealers or other surface applied materials.
- **Curing compounds** of any types have to be completely removed by means of sanding, scarification or bead-blasting. Self-dissipative curing compounds must be removed using the same methods.
- The General Contractor shall patch and repair all cracks, voids and other imperfections of concrete with high strength Portland cement based patching compounds such as Mapei Ultraplan, Ardex K-15, Ardex Feather Finish, Mapei Planipatch or equal, approved by the manufacturer. **Do not use gypsum based patching materials.**
- After completion of sanding, patching and leveling, vacuum or sweep entire surface of concrete to remove loose dust and dirt before starting the installation of material.

2.1. GYPSUM BASE SUBSTRATE

- Prohibit circulation of other trades in the installation area.
- The General Contractor shall patch and repair all cracks, voids and other imperfections of the gypsum base subfloor with high strength gypsum base patching compounds compatible with the gypsum base product.
- After completion of patching and leveling, vacuum or sweep entire surface of the gypsum base subfloor to remove loose dust and dirt.
- Apply Mapei Primer L per Mapei's instructions.
- Once the Primer has set, install the flooring following the installation instructions.
- Do not use Mapei G19 polyurethane adhesive over this type of substrate.

2.2. SUBFLOORS WITH RADIANT HEATING SYSTEMS

CLICK tile must be completely glued to the subfloor when a radiant heating system is installed.

Elements Collection can be installed over subfloors with radiant heating systems.

To ensure proper installation and enable proper adhesion, respect the following conditions:

- In all cases, it is necessary to respect the curing time of the concrete slab.
- Before the installation, the radiant heating system must have been turned on for at least 4 weeks to stabilize the moisture content of the concrete slab and to avoid any moisture peak when the system will be in service after the installation of the flooring.
- A certified technician should turn on the system as per the manufacturer recommendation.
- The temperature must be kept at its maximum 85°F for 8 days prior to the installation of the floor covering.
- The maximum temperature will not exceed 85°F at any time.
- To install on a subfloor with a radiant heating system, the system has to be turned off 48 hours before, during, and 72 hours after the installation. Always verify that the room temperature is not less than 65°F during that period of time.
- The heating system should be turned on gradually starting 72 hours after the installation.
- Turning on the heat gradually will allow the substrate and the flooring to adapt to the temperature change together.
- A sudden temperature change could result in adhesion problems.

Setting the radiant heating system prior and during the installation:

10 days to 2 days prior at 85°F	48 hours prior to the installation turned-off	Turned-off during the installation	72 hours after installation the system remains turned-off	Gradually turn on the system
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WARNING: NEVER COVER THE FLOORING WITH RUGS, MATS, RUNNERS, ETC. THESE WILL AFFECT THE HEAT TRANSFER OF THE RADIANT SYSTEM AND COULD DAMAGE THE FLOORING.

- During the drying period of the concrete slab, moisture tests shall be performed per the conditions stated in ASTM F1869, ASTM F2170 standards and substrate conditions will meet ASTM F710 standard.
- When using Gerfix TPS+ or Bentley Healthbond 2399, moisture tests for subfloors with Radiant Heating Systems shall not exceed 8-lbs./ 1000 sq. ft./24hrs. per ASTM F1869 and 90% RH per ASTM F2170.
- When using Gerfix Spray, moisture tests for subfloors with Radiant Heating Systems shall not exceed 8-lbs./ 1000 sq. ft./24hrs. per ASTM F1869 and 95%RH per ASTM F2170.
- When using Mapei G19, moisture tests for subfloors with Radiant Heating Systems shall not exceed 3-lbs./ 1000 sq. ft./24hrs. per ASTM F1869 and 75% RH per ASTM F2170.

FOR CLICK TILE ONLY:

- Moisture tests for subfloors with Radiant Heating Systems shall not exceed 8-lbs./ 1000 sq. ft./24hrs. per ASTM F1869 and 90% RH per ASTM F2170.

3. INSTALLATION OF SQUARES AND PLANKS

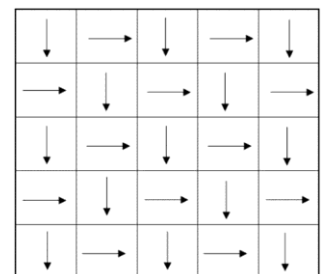
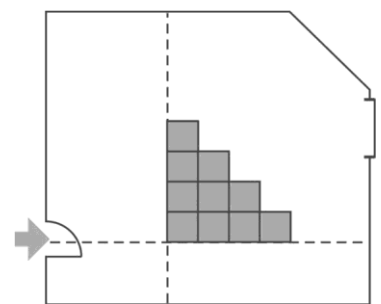
3.1. FLOORING MATERIAL INSPECTION

- Boxes are clearly marked with batch numbers and the product should be checked for match before installing.
- Inspect all materials carefully to verify that correct colors, lot number, patterns, quality and quantities have been shipped as ordered. Do not install, cut, or fit any material that has visible defects.
- **A contractor that installs material that has visible defects or damage without prior consent of Bentley deems the product acceptable for installation and therefore accepts full responsibility for said material.**

Note: Tiles have directional arrows and should be installed by alternating the arrows 90° forming a “checkerboard” pattern. Should the tiles be installed in the same direction, the seams will then be more visible, this is an observable fact inherent to the product. Remove tiles from the cartons 16-24 hours prior to installation.

3.2. SQUARE TILE LAYOUT

- Chalk the center lines of the work area in both directions so that one line is parallel to the length of the room and that the second line is on a 90° angle to the first line.
- Position center lines to allow the perimeter tiles to be \geq to $\frac{1}{2}$ tile.
- Before spreading adhesive it is recommended to lay one or two rows of tiles along both center lines to check for proper alignment.
- Mix tiles from different boxes to obtain a consistent layout.
- Be certain this tile is installed on the lines to fit the 90° angle.
- After the first tile is in place, begin laying tiles outward along both guide lines.
- Press tiles firmly against adjoining tiles and press into the adhesive.
- Begin stair-stepping the tiles into the field area.
- It is recommended to install the tiles in a checkerboard pattern (90°).



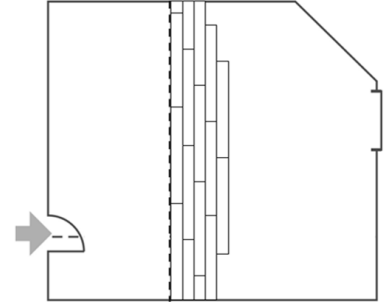
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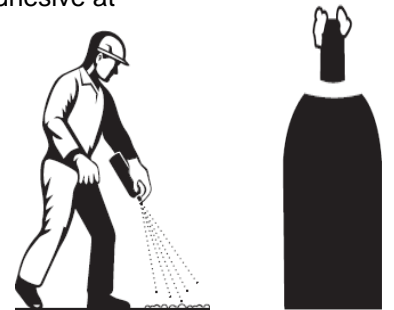
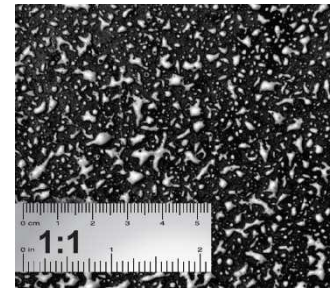
3.3. PLANK TILE LAYOUT

- Chalk the center lines of the work area so that the line is parallel to the length of the room.
- Before spreading adhesive it is recommended to lay one or two rows of planks along center line to check for proper alignment.
- Mix planks from different boxes to obtain a consistent layout.
- Be certain the planks are installed right on the center lines.
- After the first row of planks is in place, begin laying planks outward.
- Press planks firmly against adjoining planks and press into the adhesive.
- Begin stair-stepping the planks into the field area.



3.4. GERFIX SPRAY LVT & PLANK ADHESIVE INSTALLATION METHOD

- Use only Bentley's Gerfix LVT & Plank Spray adhesive.
- **Always refer to the Gerfix Spray LVT & Plank Adhesive Technical Data Sheet.**
- Follow the guidelines indicated on the container of adhesive.
- Recommended spray pattern:
- Coverage up to 185 sq. ft. per can.
- Ensure substrate, flooring and surrounding areas are clean and dust free.
- Damp-mop substrate if dust is present.
- Only use Cement-based patching and leveling compounds.
- Wipe hand across surface to verify for dust.
- If dust transfers, substrate is not clean.
- Protect from overspray with a spray shield, drop cloths or paper with masking tape.
- Starting from the center lines and working outward, apply the adhesive to the subfloor.
- Shake aerosol can well. Remove white cap.
- To ensure uniform adhesion of the entire surface, spray a workable amount of adhesive at one time.
- Stand straight up to spray. Hold can upside down, approximately 20-30 inches horizontally from the substrate, aim at floor and press tip with finger.
- Walk right to left smoothly to achieve results as seen on photo.
- Adhesive should spray out in a wide mist and fall similar to snow.



NOTE:

- Spraying in a sweeping motion may result in an inconsistent spray pattern.
- Excess buildup or inconsistent spray pattern on substrate may cause telegraphing.
- Avoid extremely heavy application.
- To ensure optimal spray pattern, remove any adhesive build up that may occur during the application process.



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- If overspray occurs, it may be removed with a damp cloth while the adhesive is still wet.
- Allow adhesive to dry until there is no adhesive transfer when lightly touched. (10-20 min).
- High humidity and/or low temperature increases tack time.
- Open time after application is 3 hours. While open, ensure that adhesive is not contaminated by dust.
- Roll flooring with a 3 section 100-lbs roller within 1 hour after installation to complete the bonding process.
- Floor is open to all traffic immediately after installation.

3.5. GERFIX TPS+ or BENTLEY HEALTHBOND 2399 ACRYLIC ADHESIVE INSTALLATION METHOD FOR TILES AND PLANKS

- Always refer to the Gerfix TPS+ or Bentley Healthbond 2399 Technical Data Sheet.
- Follow the guidelines indicated on the pail of adhesive.
- Recommended trowel size is 1/16" x 1/32" x 1/32" U notch, covering up to 245 sq. ft. per U.S. gallon.
- Starting from the center lines and working outward, apply the adhesive to the subfloor.
- To ensure uniform adhesion of the entire surface, apply a workable amount of adhesive at one time.
- Maintain a uniform spread rate. Replace trowel (or trowel blade) with every pail used.
- Immediately after troweling the adhesive onto the concrete use a medium napped paint roller saturated with adhesive to flatten out visible trowel marks and even out the adhesive. **A double arm roller frame is recommended to ensure an even coat of adhesive.**
- **Open time is the combination of flash time and working time.**
- "Open time" of the adhesive is dependent upon porosity of the substrate, temperature, and humidity. It is important that the installers familiarize themselves with the adhesive before starting the installations. Insufficient open time for acrylic adhesive will cause bubbling. An insufficient open time will result in poor *adhesion*.

Application Characteristics over Porous Substrates		
	Flash Time*	Working Time**
Elements Square and Plank	20 to 40 minutes (to reach a tacky state)	40 to 90 minutes

* Flash Time is the waiting time required before installing flooring.

** Working time is the window of time for the adhesive to accept flooring.

*** Wet tacky: When parts of the adhesive show whitish areas, but still has some tackiness.

Note: Flash time and working time may vary based on temperature, humidity, substrate porosity, trowel size and jobsite conditions.

- Once flooring is placed into the adhesive, immediately roll thoroughly with a 3 sectional 100-lbs steel roller in both directions.

Note: Use a 14" to 16" cork board or a piece of 2" x 4" wrapped with a piece of carpet to remove air bubbles.



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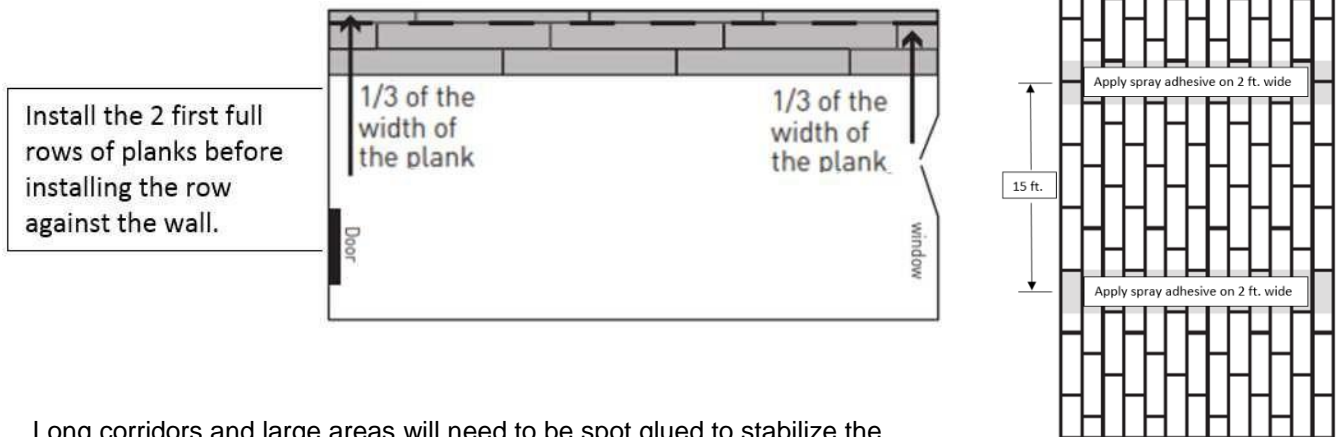
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- Continue laying tiles by butting the edges together without too much pressure.
- During the installation, always double check the flooring for bubbles with the lights on and off.
- Avoid adhesive displacement by prohibiting traffic for a period of 48 hours and 72 hours for rolling loads.
- **The use of walking boards is mandatory to protect from adhesive displacement during installation.**

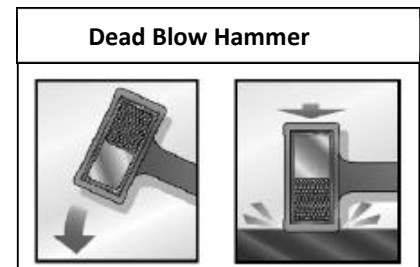
4. INSTALLATION OF CLICK TILE

4.1. CLICK TILE LAYOUT

- Chalk the center line.
- Report the axe by a multiple of the width of a plank along the starting wall.
- Using a dead blow rubber mallet or the Romus heavy hand roller, align the planks properly and lock them together.
- Install the 1st and 2nd rows down from the axis to stabilize the installation and then install the row against the wall.
- Mix planks from different boxes to obtain a consistent layout.
- Begin stair-stepping the planks into the field area.



- Long corridors and large areas will need to be spot glued to stabilize the installation.
- As a general rule of thumb, apply adhesive every 15 lin ft. in both directions.
- Gerfix LVT & Plank Adhesive is recommended in these cases.



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5. ONCE THE INSTALLATION IS COMPLETED

- Perform a visual inspection of the project.
- Repair every imperfection before leaving the project.
- Make sure that every vertical obstacle such as door frames is well trimmed and sealed with a silicone sealer or an equivalent product.

6. ADHESIVE

USAGE AND RH MOISTURE LIMITS FOR GERFLOR APPROVED ADHESIVES	
PRODUCT: ELEMENTS COLLECTION	
Adhesives:	
Gerfix TPS+	90% RH *** (Radiant Heating Systems)
Gerfix TPS+	95% RH
Gerfix LVT Spray	95% RH
Bentley Healthbond 2399	95% RH
Corresponding concrete slab moisture tolerance between ASTM F2170 RH moisture test & ASTM F1869 Ca Cl test	
RH test	Ca Cl test = lbs/1000 Sq. Ft. / 24 hrs
95%	8 lbs
90%	
NOTE:	
1) pH level shall not exceed 11 at all time	
2) *** Radiant heating systems	
Bentley's position on moisture testing:	
Bentley requires concrete slab moisture testing and recognizes 2 test methods to measure the moisture in a concrete slab:	
ASTM F2170 RH test	
ASTM F1869 Calcium Chloride test	
The best choice is to do both tests side by side. This way, all the information needed to properly assess the moisture condition of the concrete slab will be available.	
When performing the tests, both tests need to pass the moisture requirements.	
Should there be a decision to perform only one type of test, Bentley prefers the ASTM F2170 RH test, as this is the most accurate test available at this time.	

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7. FREE LAY

- It is important to balance the layout of the plank format. Proper planning and layout will prevent narrow plank widths or lengths at wall junctures. Identify which direction the planks will run in the room, typically the planks will run lengthwise in the longest dimension of the room.
- Accurately measure the room and identify the center point. Next determine if that center point would result in planks less than half width or very short in length being on either side of the room against the wall. If this will be the case adjust the center line accordingly to a point where you have at least half width or medium length plank on the edges against the wall.
- Apply releasable adhesive using **only a 1/16" x 1/32" x 1/32" U notch** trowel in 1 foot widths on both sides of the center line and all the way around the perimeter of the room. For large areas see note below regarding spacing of additional adhesive strips. Allow adhesive to set up. This provides for multiple anchor points to hold the Free Lay installation firmly in place.
- Start by laying a full plank around the center line. You can start it right at the center line or overlap the center line. Work outward from the center point toward the perimeter in both directions installing the planks end to end. If you have multiple installers have one move in one direction and the other the opposite so as to maximize efficiently. As you progress to the next row overlap the seams by at least $\frac{1}{4}$ of the length of the one before it. Keep in mind you are creating a random looking installation that will mimic a natural look. As you proceed overlap the prior rows by differing amounts ensuring that seams do not line up.
- Finish by cutting in the fill pieces on the side allowing an expansion area of $\frac{1}{4}$ " around the perimeter. This is necessary to allow for some expansion or contraction of the product.
- Protect your installed Kolay flooring from exposure to extreme or direct sunlight. Prolonged, direct sunlight will heat your floor, forcing it to expand. When the floor temperature drops after the sun passes, your floor will shrink-causing the floor to separate, especially in areas where the flooring is pinned or where heavy objects are on the floor. In areas where large windows or sliding glass doors are present, shades are needed to protect your floor from sunlight during all seasons.

PLEASE NOTE: If you are installing the Free Lay in an area larger than 25 feet wide, then you will need to utilize a grid system and add 1 foot trowel widths of adhesive accordingly. Large open areas should be a 20 foot grid and smaller areas can go as low as 10 feet.


DIAGRAM: ADHESIVE LAYOUT FOR (5 mm) FREE LAY for 9 in x 48 in and 18 in x 36 in

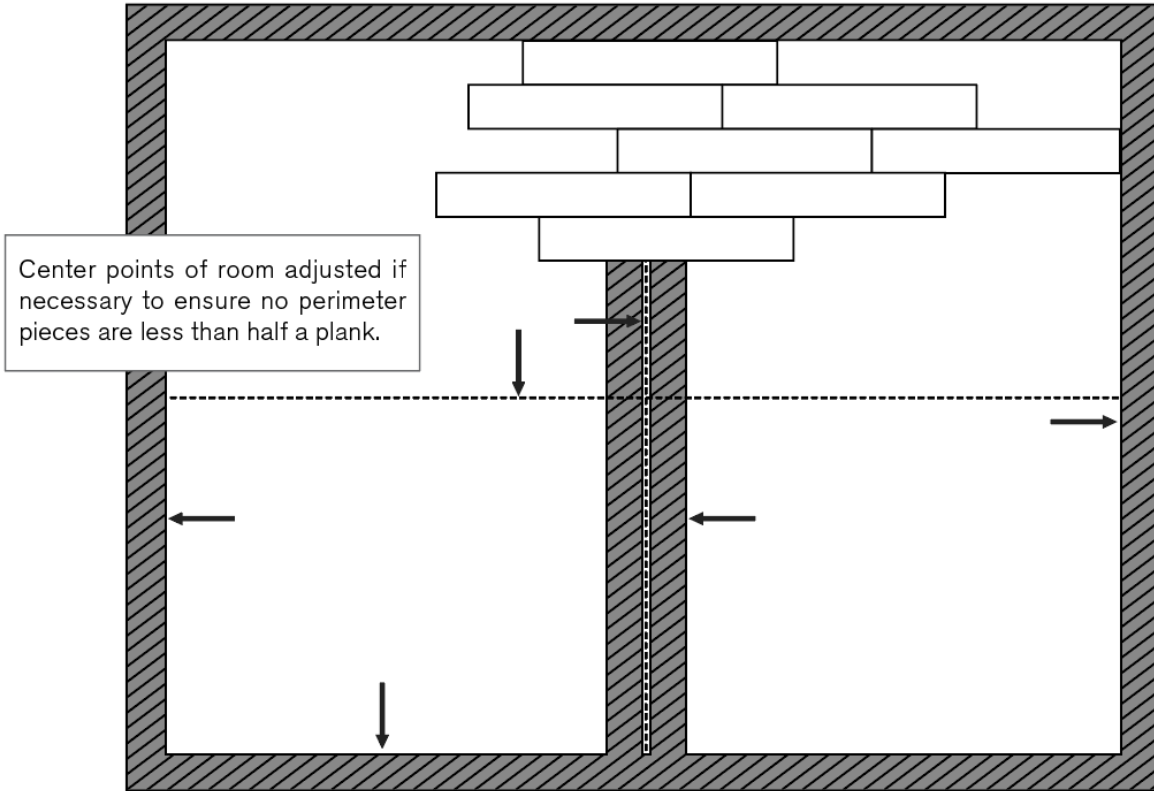
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Adhesive Layout for LVT (5 mm) Free Lay 9 in x 48 in and 18 in x 36 in

 Represents one foot strips of adhesive



For any information, please refer to Bentley Technical Services at 800.423.4709.

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